PATENT
Attorney Docket No. 214597
Client Reference No. GN00103

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Vander Aa

Art Unit: 1752

Application No. 10/021,358

Examiner: John S. Y. Chu

Filed: December 7, 2001

For: Method of Processing a Printing Plate Material With a Single-Fluid Ink

RESPONSE TO OFFICE ACTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

In response to the Office Action dated December 1, 2003, reconsideration is requested in view of the following. This response is accompanied by a request for continued examination (RCE).

Pending Claims

Claims 1, 2, and 6-28 are currently pending. The presently claimed invention is directed to a unique method of lithographic printing, and employs single-fluid ink containing an emulsion of a hydrophobic ink phase and a non-aqueous polar phase, which unexpectedly produces successful results.

Office Action

Claims 1, 2, and 6-16 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over the Vermeersch et al. '750 (U.S. Patent 6,030,750) in view of Kingman et al. (U.S. Patent 6,140,392) and Teng et al. (U.S. Patent 6,548,222). Claims 17-28 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Vermeersch et al. '128 (U.S. Patent 5,786,128) in view of Kingman et al. and Teng et al.

Discussion of Rejections

The rejections are respectfully traversed. The Office Action alleges that it would have been obvious to one of ordinary skill in the art of on-press lithographic printing plate development to use a single-fluid ink developer as the developing solution in place of the fountain/aqueous solution in the art of Vermeersch et al. '750 (or '128) with the reasonable expectation of same or similar results of excellent printing endurance, ink acceptance. Applicants respectfully submit that the Office Action has failed to make a *prima facie* case for obviousness.

First, applicants respectfully disagree with the Office Action's view that the cited references are combinable because of the simple reason that they belong to the same technological field of wet development lithographic printing plate precursors. The field of wet lithographic printing plate precursors is very broad and diverse, and contains many sub-domains, and the problems addressed in each subdomain are quite different. Thus, applicants respectfully submit that lumping everything together under one name ignores the many distinct features among the various sub-domains.

Teng et al. uses a thermosensitive layer in the preparation of its negative thermographic printing plate. As part of that layer, Teng et al. requires the use of a layer that is "capable of hardening through polymerization or crosslinking upon exposure to an infrared radiation". Hardening, according to Teng et al., "is achieved through polymerization or crosslinking of [two] resins" (col. 3, l. 66 to col. 4, l. 8).

In stark contrast, Vermeersch et al. '750 teaches the use of technology that is distinct from Teng et al. Vermeersch et al. '750, unlike Teng et al., uses fully formed polymers in their imaging layers and renders the imaging layer insoluble. Specifically, the Vermeersch et al. '750 imaging layers include a hydrophilic binder and fully formed polymers (e.g., hydrophobic thermoplastic polymer particles), wherein the hydrophilic binder is "preferably not cross-linked or only slightly cross-linked" (col. 4, ll. 26-33).

Teng et al. utilizes plate technology that is distinct from the technology used in the Vermeersch et al.'750 and in the presently claimed method. The Teng et al. technology is not only distinct; it is fundamentally incompatible with the Vermeersch '750 plate technology. There is thus no basis in the references themselves to support the asserted combination of Teng et al. and Vermeersch et al. '750.

There is, thus, no teaching in Vermeersch et al. '750 to polymerize or cross-link the hydrophobic thermoplastic polymers. This distinction (use of polymerizable components (Teng et al.) v. use of thermoplastic polymers (Vermeersch et al. '750)) segregates Teng et al. and the Vermeersch et al. '750 into two separate, and incompatible, plate technologies. There is, therefore, no basis in the references themselves to support the asserted combination of

Teng et al. and Vermeersch et al.'750. The obviousness rejection should be withdrawn on this basis alone.

Second, there is no reasonable expectation of success in arriving at the presently claimed invention even if Vermeersch et al. '750 and Teng et al. are properly combinable.

The plates taught by Vermeersch et al.'750 become insoluble by latex coalescence in imaged areas and the non-imaged areas are removed by processing with ink and fountain solution. The latex or the hydrophobic thermoplastic particles in the plates taught by Vermeersch et al. '750 coalesce under the influence of exposure to heat and/or light. Coagulation may result from heat-induced coalescence, softening or melting of the thermoplastic polymer particles. This thermally induced coagulation of the hydrophobic polymer particles results in a different capacity of being penetrated and/or solubilized by aqueous fountain solution. The decreased capacity of being penetrated and/or solubilized by the aqueous fountain solution, results in a clean out of the non-imaged parts without solubilizing and/or damaging the imaged areas. In other words, not only should the non-imaged areas be removable using single-fluid inks instead of the ink and fountain solution taught in the prior art documents, but also the imaged areas should be resistant i.e. insoluble, towards the single-fluid ink. However, starting from the teaching of Teng et al., there is no indication that both these requirements would be fulfilled for the plates of Vermeersch et al. '750, at least for the following two reasons:

Contrary to Vermeersch et al. '750, Teng et al. teaches insolubilization of the imaged areas through polymerization or crosslinking of two resins (monomers, oligomers or polymers): thus chemical covalent bonds are formed resulting in an insolubility towards single-fluid ink compositions. In the plates of Vermeersch et al. '750, the exposed areas become insoluble towards ink and fountain only by heat-induced coalescence, softening or melting of the thermoplastic polymer particles, i.e. without the formation of covalent bonds. It is, in other words, not at all evident that the imaged areas of such plates which are resistant towards conventional, greasy lithographic ink and fountain solution, are also resistant to single-fluid inks which comprise a polar nonaqueous phase instead of an aqueous phase.

The ingredients, which should be removable when not exposed, used in the plates of Teng et al. are totally different than the ingredients used in plates based on latex coalescence. As an example, the hydrophobic polymers in the plates of Vermeersch et al. '750 are necessarily present in particle form while the hydrophobic polymers in the plates of Teng et al. are "binders" (see column 7 line 3-24), i.e., they form a film matrix immediately after coating (the particles of Vermeersch et al. form a matrix upon image-wise exposure). It is therefore not evident that the non-imaged areas of Vermeersch et al. '750 are removable by using single-fluid ink instead of ink and fountain solution.

The foregoing shows that the utilization of single-fluid ink instead of ink/fountain solution as developer should not only ensure the complete removal of the non-imaged areas, but should also ensure that the imaged areas remain unaffected. Both these process requirements are not derivable from Teng et al. because there is no such indication in Teng et al. that single-fluid ink would work for other plates than the plate of his invention (col. 11, lines 33-37): "The recently introduced single-fluid ink by Flint Ink Company, which can be used for printing wet lithographic plate without the use of fountain solution, can also be used for the on-press development and printing of the plate of this invention."(Emphasis added).

There is no hint in Vermeersch et al. '750 that plates based on latex coalescence could be processed with *a non-aqueous developer* and there is neither a hint in Teng et al. that other plates than his plates could be processed with single fluid ink resulting in removal of the non-imaged areas without affecting the imaged areas. The combination of the cited documents leading to the presently claimed invention can therefore only be done by improper hindsight. In other words, the specific combination of the features of claims 1, 2, and 6 – 16, i.e., plates comprising latex particles combined with development with single fluid ink – is not *prima facie* obvious and the rejections against these claims does not comply with the M.P.E.P requirement (Section 706.02(j)) which outlines that prior art documents should teach or suggest to make the claimed combination with reasonable expectation of success. In the cited art, no hint to the claimed combination can be found.

As the cited references Vermeersch et al. '750 and Teng et al. direct those of ordinary skill in the art towards using an aqueous fountain solution, the use of a single-fluid ink containing a nonaqueous phase to obtain excellent results in unexpected and inventive. Kingman et al. fails to cure the deficiencies of Vermeersch et al. '750 and Teng et al. Kingman et al. is silent on the type of plate polymers to be used in its invention.

Following the same reasoning, the combination of the plate technology taught by Vermeersch et al. '128 (i.e., photolysis of aryldiazosulfonates) and the alleged suggestion by Teng et al. to use single-fluid ink as developer, is not justified and the rejection of claims 17 – 28 is erroneous.

Teng et al. utilizes plate technology that is distinct from the technology used in the Vermeersch et al. '128 and in the claimed method. The Teng et al. technology is not only distinct; it is fundamentally incompatible with the Vermeersch et al. '128 plate technology. There is thus no basis in the references themselves to support the asserted combination of Teng et al. and Vermeersch et al.'128.

As discussed, Teng et al. uses a thermosensitive layer in the preparation of its negative thermographic printing plate. As part of that layer, Teng et al. requires the use of a

layer that is "capable of hardening through polymerization or crosslinking upon exposure to an infrared radiation". Hardening, according to Teng et al., "is achieved through polymerization or crosslinking of [two] resins" (col. 3, l. 66 to col. 4, l. 8).

In stark contrast, Vermeersch et al. '128 teaches the use of technology that is distinct. Vermeersch et al. '128, unlike Teng et al., uses aryldiazosulfonate polymer, which upon exposure to light, cleaves the sulfonate group, rendering the polymer insoluble. There is, thus, no teaching in Vermeersch et al. '128 to polymerize or cross-link two resins. This distinction (use of polymerizable components (Teng et al.) v. use of light-sensitive polymers (Vermeersch et al. '128)) segregates Teng et al. and the Vermeersch et al. '128 patents into two separate, and incompatible, plate technologies. There is, therefore, no basis in the references themselves to support the asserted combination of Teng et al. and Vermeersch et al. '128. The obviousness rejection should be withdrawn on this basis alone.

Second, there is no reasonable expectation of success in arriving at the presently claimed invention even if Vermeersch et al. '128 and Teng et al. are properly combinable.

The plates of Vermeersch et al. '128 based on aryldiazosulfonate polymer do not involve hardening through polymerization or cross-linking. The aryldiazosulfonate polymer is present as a film-forming binder coating. The imaging mechanism of such a coating relies on heat- or light-induced insolubilization. The imaged areas become insoluble by photolysis of the water-solubilizing aryldiazosulfonate group: i.e., the diazo bond of the aryldiazosulfonate polymer decomposes with release of nitrogen, thereby splitting off the sulfonate group and rendering the polymer insoluble. As discussed for Vermeersch et al. '750, not only should the non-imaged areas be removable using single-fluid inks instead of the ink and fountain solution taught in the cited documents, but also the imaged areas should be resistant, i.e., insoluble, towards the single fluid ink. However, starting from the teaching of Teng et al., there is no indication that both these requirements would be fulfilled for the plates of Vermeersch et al. '128 for the following reasons.

The plates of Vermeersch et al. '128 can be distinguished from Teng et al.'s because there is no formation of crosslinking covalent bonds, and as a result, it is not evident that the imaged areas of these plates which, according to the cited reference, are resistant towards 'conventional' ink and/or fountain solution, are also resistant to single-fluid inks which comprise a polar nonaqueous phase instead of an aqueous phase.

The coating solution of the plates of Vermeersch et al. '128 comprises aryldiazo sulfonate polymer dissolved in demineralized water; it would therefore direct the skilled person to believe that the non-imaged areas of such plates are removable only with (an aqueous) fountain solution. However, single-fluid ink does not contain water. The

ingredients of Vermeersch et al. '128 plates which should be removable (in unexposed areas) are also totally different than the ingredients used in the plates of Teng et al., and therefore, there is no indication starting from Teng that the non-exposed ingredients of Vermeersch et al. '128 would be removable in single-fluid ink, as single fluid ink comprises no aqueous phase. It is therefore not evident that the non-imaged areas of Vermeersch et al. '128 plates are removable by using single-fluid ink instead of ink and fountain.

The foregoing shows that the utilization of single-fluid ink instead of ink/fountain solution as developer should not only ensure the complete removal of the non-image areas, but should also ensure that the imaged areas remain unaffected. Both these process requirements are not derivable from Teng et al. because there is no such indication in Teng et al. that single-fluid ink would work for other plates than the plate of his invention (col. 11, ll. 33-37): "The recently introduced single-fluid ink by Flint Ink Company, which can be used for printing wet lithographic plate without the use of fountain solution, can also be used for the on-press development and printing of the plate of this invention."(Emphasis added).

There is no hint in Vermeersch et al. '128 that its plates could be processed with *a non-aqueous developer* and there is not a hint in Teng et al. that other plates than his plates could be processed with single fluid ink resulting in removal of the non-imaged areas without affecting the imaged areas. The combination of the cited documents leading to the presently claimed invention can therefore only be done by improper hindsight. In other words, the specific combination of the features of the present claims is not *prima facie* obvious and the rejections against these claims does not comply with the M.P.E.P requirement (Section 706.02(j)) which outlines that prior art documents should teach or suggest to make the claimed combination with reasonable expectation of success. In the cited documents, no hint to the claimed combination can be found.

Further, with respect to the rejections, there is no basis in the references themselves that supports the asserted combination of the cited references. The Office Action uses Kingman et al. in an apparent attempt to provide the teaching absent in Vermeersch et al. patents concerning the type of developing fluid. The Kingman et al. fluid is comprised of continuous ink and a non-aqueous polar solvent. In contrast, Vermeersch et al. '128 (or '750) prefers water as a developing fluid. See, e.g., col. 8, ll. 32-38 of Vermeersch et al.'128. There is, thus, no motivation, for example, to combine Vermeersch et al.'128 (or '750) with Kingman et al. Vermeersch et al. '128 teaches the use of water. The use of the Kingman et al. fluid, which is not water *per se* (and which would also not be categorized as an aqueous liquid), would directly conflict with the teaching in Vermeersch et al. '128. Because there is no motivation in the references themselves to use the non-aqueous Kingman et al. fluid in the

Vermeersch et al. '128 or '750 methods, the obviousness rejection is erroneous and should be withdrawn.

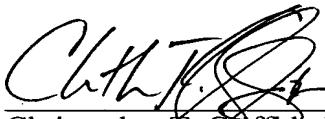
In addition, the successful processing of printing plates based on latex coalescence or aryldiazo sulfonate polymer (after irradiation) by the use of single fluid ink is unexpected and inventive.

In view of all of the foregoing, allowance of the pending claims is respectfully solicited.

Conclusion

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,



Christopher T. Griffith, Reg. No. 33,392
LEYDIG, VOIT & MAYER, LTD.
Two Prudential Plaza, Suite 4900
180 North Stetson
Chicago, Illinois 60601-6780
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

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